

REMARKS

This Preliminary Amendment is filed in order to facilitate processing of the above-identified application and is filed in response to the Office Action dated January 30, 2001, in which the Examiner rejected claims 1-2, 11 and 26 under 35 U.S.C. §102(b) and rejected claims 3-10, 12-20 and 27-34 under 35 U.S.C. §103.

As indicated above, the claims have been amended to specify an inherent feature. It is respectfully submitted that the amendment does not narrow the literal scope of the claims and is unrelated to a statutory requirement.

Claim 1 claims a thermoplastic resin injection molding machine comprising a plasticating unit, an injecting unit and a buffering unit. The injecting is connected to the plasticating unit through a connection passage. The buffering unit is provided in the connecting passage and is different from the injecting unit.

Thus, through the structure of the claimed invention having an injecting unit connected to the plasticating unit through a connection passage and a buffering unit provided in the connecting passage and different from the injecting unit, as claimed in claim 1, the claimed invention provides a thermoplastic resin injection molding machine with a shortened molding cycle. The prior art does not show, teach or suggest the invention as claimed in amended claim 1.

Claim 3 claims an injection molding machine comprising a plasticating unit, and an injecting unit. The injecting unit is connected to the plasticating unit through a connecting passage. The plasticating unit has a buffering chamber which is defined by a top portion of a movable screw and a cylinder and which is different from the injecting unit.

Through the structure of the claimed invention having an injecting unit connected to the plasticating unit through a connecting passage and having a plasticating unit comprising a buffering chamber which is defined by a top portion of a movable screw and a cylinder and which is different from the injecting unit, as claimed in claim 3, the claimed invention provides an injection molding machine in which the molding cycle can be reduced. The prior art does not show, teach or suggest the invention as claimed in claim 3.

Claims 1-2, 11 and 26 were rejected under 35 U.S.C. §102(b) as being anticipated by *Annis, Jr. et al* (U.S. Patent No. 3,674,401). In addition, claims 3, 13 and 27 were rejected under 35 U.S.C. §103 as being unpatentable over *Annis, Jr. et al* in view of *Taniguchi* (U.S. Patent No. 5,002,717).

Annis, Jr. et al appears to disclose in FIG. 2 a plasticator 1 having a screw 6. The screw 6 reciprocates in a chamber 4. Material forced through nozzle 12 enters discharge channel 18 and is input to mold assembly 42. In FIG. 3, a single action pump 50 has a chamber 51 which receives molten material from a plasticator 1 having a plasticator screw 6 which is rotated by a motor M. The injection molding material worked by the plasticator screw 6 is maintained at a temperature below foaming temperature of the blowing agent used, preferably by cooling means as shown in FIG. 1. Thus, the molten injection molding material enters the pump 50 at a temperature below the foaming temperature. As the material enters the pump 50 it causes a piston 52 and piston rod 54 to move upwardly, as viewed in FIG. 3. When the piston 52 has risen to a point selected in accordance with the volume of molten material desired in the pump, the plasticator screw 6 is stopped and/or the valve 20 is closed and the piston 52 caused to move downwardly. Downward

movement of the piston 52 forces the molten material therein out the nozzle 56 and into the channel 18.

Thus, *Annis, Jr. et al* merely discloses in FIG. 3 a pump 50 (i.e. injector) having a chamber 51 (i.e. reservoir) which receives molten material from nozzle 12 of a plasticator 1. In other words, the chamber 51 is located in the pump 50. Thus, nothing in *Annis, Jr. et al* shows, teaches or suggests a buffering unit which is different from the injecting unit as claimed in claim 1. Rather, *Annis, Jr. et al* merely discloses a single action pump 50 having a chamber 51 which receives material from a nozzle 12 of a plasticator 1.

Additionally, *Annis, Jr. et al* merely discloses in FIG. 2 a screw 6 reciprocating in a chamber 4, a nozzle 12 of plasticator 1 and discharge channel 18. Nothing in *Annis, Jr. et al* shows, teaches or suggests an injecting unit is different from a buffering unit defined at a top portion of a movable screw and which reserves a amount of resin at least equal to an injection shot as claimed in claim 3.

Taniguchi appears to disclose designated at numeral 13 is the operation and control means which serves to control the entirety of the injection molding machine; it consists of a microcomputer. Upon receipt of input from an injection stroke sensor 18 and an injection pressure sensor 19, the operation and control means 13 recognizes, based on the information, the advance stroke (injection stroke), injection speed and injection pressure of the screw 2. Based on an injection control program and the above-mentioned input, the operation and control means 13 also drives under control the rotary drive unit 10 by way of a driver 14 and a hydraulic pressure control system 16 and the axial drive unit 11 by way

of another driver 15 and another hydraulic pressure control system 17 as will be described herein.

Thus, *Taniguchi* merely discloses an injection pressure sensor 19. Nothing in *Taniguchi* shows, teaches or suggests an injecting unit which is different from a buffering unit as claimed in claims 1 and 3.

Since nothing in *Annis, Jr. et al* taken singularly or in combination with *Taniguchi* shows, teaches or suggests the invention as claimed in claims 1 and 3, it is respectfully requested that the Examiner withdraws the rejection to claim 1 under 35 U.S.C. §102(b) and withdraws the rejection to claim 3 under 35 U.S.C. §103.

Claims 2, 11, 13, 26 and 27 depend from claims 1 and 3 and recite additional features. It is respectfully submitted that claims 2, 11 and 26 would not have been anticipated by *Annis, Jr. et al* within the meaning of 35 U.S.C. §102(b) at least for the reasons as set forth above and that claims 13 and 27 would not have been obvious over *Annis, Jr. et al* and *Taniguchi* at least for the reasons as set forth above. Therefore, it is respectfully requested that the Examiner withdraws the rejection to claims 2, 11 and 26 under 35 U.S.C. §102(b) and withdraws the rejection to claims 13 and 27 under 35 U.S.C. §103.

Claims 4-7 and 28-31 were rejected under 35 U.S.C. §103 as being unpatentable over *Annis, Jr. et al* in view of *Cheng* (U.S. Patent No. 5,098,267). Claims 8, 10, 12, 14-15 and 32 were rejected under 35 U.S.C. 103 as being unpatentable over *Annis, Jr. et al* and *Taniguchi* and further in view of *Cheng*. Claims 9 and 33-34 were rejected under 35 U.S.C. §103 as being unpatentable over *Annis, Jr. et al* in view of *Morita* (U.S. Patent

No. 6,109,909). Claims 16-19 were rejected under 35 U.S.C. §103 as being unpatentable over *Annis, Jr. et al* modified by *Cheng* and further in view of *Morita*. Claim 20 was rejected under 35 U.S.C. §103 as being unpatentable over *Annis, Jr. et al*, *Taniguchi* and *Cheng* and further in view of *Morita*.

It is respectfully submitted that since *Annis, Jr. et al* does not disclose the primary features of the invention as claimed in claims 1 and 3 as discussed above, it is respectfully submitted that the combination of *Annis, Jr. et al* with the secondary references will not overcome the deficiency of *Annis, Jr. et al*. Therefore, it is respectfully requested that the Examiner withdraws the rejection to these claims under 35 U.S.C. §103.

Thus, it now appears that the application is in condition for reconsideration and allowance. Reconsideration and allowance at an early date are respectfully requested.

If for any reason the Examiner feels that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed within the currently set shortened statutory period, applicant respectfully petitions for an appropriate extension of time. The fees for such extension of time may be charged to our Deposit Account No. 02-4800.

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In the event that any additional fees are due with this paper, please charge our
Deposit Account No. 02-4800.

Respectfully submitted,

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Date: March 29, 2002

Marked Copy of Claim 1

1. (Amended) A thermoplastic resin injection molding machine comprising:
a plasticating unit for plasticating a thermoplastic resin,
an injecting unit connected to the plasticating unit through a connecting passage, to
inject the plasticated resin into a mold, and
a buffering unit provided in said connecting passage to reserve the resin plasticated
in the plasticating unit in an amount at least equal to the injection quantity of the resin per
shot, and feed the resin into the injecting unit, wherein the buffering unit is different from
the injecting unit.

3. (Amended) An injection molding machine comprising:
a plasticating unit for plasticating a thermoplastic resin, and
an injecting unit connected to the plasticating unit through a connecting passage, to
inject the plasticated resin into a mold,
said plasticating unit comprising a cylinder, a screw rotatable and movable in the
axial direction in the cylinder, means for rotation-driving the screw, a buffering chamber
which is different from the injecting unit and which is defined by the top portion of the
screw and the cylinder to reserve the plasticated resin in an amount at least equal to the
injection quantity of the resin per shot, and means of energizing the screw forward in the
axial direction to feed the resin in the buffering chamber into the injecting unit.